Vol. 3 No. 5

MAY, 1947

SPE NEWS

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(See Inside Back Cover)

SPE NEWS

Issued Monthly to all Members of the Society of Plastics Engineers

Vol. 3 No. 5 May, 1947

INJECTION MOLDING PROBLEMS

By GORDON B. THAYER
Plastics Research Engineer
The Dow Chemical Company

In the search for new and improved consumers goods, American manufacturers are looking at injection molded plastics, among other things. These plastics have had a considerable amount of success to date, and there have been some severe disappointments. Many of the successful applications have been dependent for their success upon the ingenuity of the injection molders.

Much progress has been made in injection molding because of the pioneering work which has been undertaken by the molders. They have built molds which cost from $10,000 up to mold pieces which couldn't be molded, and then they have produced the moldings at remarkably low costs. In so doing, molders and their customers have engaged in heated arguments, have decided not to do business with each other again, have finally solved their problems, and started on the next ones.

Observation of some of these negotiations, and participation in others, leads to the thought that perhaps the way might be smoothed somewhat by analyzing some of the reasons for difficulties encountered when the molder takes on work which is new to his staff. There is not usually much difficulty involved when the work is similar to other molding which has been done previously in the plant. It is when new work is attempted that difficulties appear.

How much is a molded part going to cost? Every molder has to show his prospective customer the answer to this question. When the part involved is new and difficult, the prospective customer often has to tell the molder how much the part may cost. In many cases, costs have to be reconsidered after molding production has begun, because unforeseen difficulties appear. Very often this has a discouraging effect upon both the molder and the purchaser. Good business practice demands that the molder do everything he can to avoid such occurrences.

One of the results of the rapid expansion of injection molding into new fields of product applications has been a more free exchange of information between molders and purchasers of molded parts. There is a growing tendency for molders and their customers to sit down together and study the details of the cost estimates for new and difficult parts. Where formerly there was much polite sparring, there is appearing a frankness and freedom to discuss fully, methods, processes, and operating costs. This seems to be a good idea.

When a new molded product is under consideration, much attention must be given to many details. Any or all of a long list of factors may enter the problem. It often happens, in the rush to get production under way, that allowance for one important item or another is omitted, and a costly procedure is added after all arrangements are supposedly satisfactory.

It is suggested that a list of the factors which may become involved in planning new work be assembled, to serve as a reminder for the engi-

(Continued on Page 10)

Gordon Thayer, well-known authority on plastics molds and molding, earned his B. S. degree in Mechanical Engineering from the University of Michigan. He worked as a machine designer in Detroit and was an instructor in Engineering Drawing, Calculus and Physics at Jackson Junior College. In 1939 he was an engineer in the General Industries Co., Plastics Molding Division. In 1941 he moved to the Dow Chemical Co., as molding research engineer in the Saran Development Laboratory. In recent months his work has been that of customer service work on general molding problems which concern all of the Dow plastics.

He is the author of the well-known "Plastics Mold," now in its third edition and a number of technical articles. He is a member of SPE, S. P. I., and of the Midland Engineering Society.

SPE NEWS

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Sent free to all members—$2.50 yearly to non-members

SPI - SPE WORK TOWARD AGREEMENT; COOPERATION PLEDGED BY BOTH

April 22, 1947

Mr. J. R. Hoover, President,
Plastics Materials Manufacturers Association
% B. F. Goodrich Chemical Company
Rose Building
Cleveland, Ohio
Dear Jack:

"The Directors of SPI have recognized the objection of the SPE Council to the proposal of February 19, concerning the formation of a new engineering organization for the industry.

"It is the feeling of the SPI Directors that the proposal was both fair and reasonable. However, this in no way reflects on the sincerity or merits of the SPE objection. We can appreciate why some members of SPE objected to that clause establishing company membership in SPI as a requisite for individual membership in the new engineering organization if the employer company were qualified for SPI membership.

"We feel that it is important for the good of the industry that this problem be resolved as soon as poossible. We have, herefore, authorized the PMMA Committee which has been acting as an intermediary in these negotiations to present an amended proposal.

"The important change is to the effect that all members of SPE in good standing who meet the eligibility standards shall become members of the new unified organization without regard to their company status as members, non-members or prospective eligible members of SPI. However, after the formation of the new engineering organization from among the present membership of SPI and SPE, the clause providing for company membership in SPI on some basis is to become effective and new individuals seeking membership in the engineering organization must meet this proviso.

"The only individuals who could be affected by this clause as now amended must of necessity be nonmembers of either SPE or SPI as of this moment. Therefore, disagreement with this clause can only be a disagreement in principle. At this point it should be made clear in this negotiation to date SPI has

(Continued on Page 8)

Two New Sections Join SPE Midcontinent and Rocky Mountain Are Number 18 and 19

Society of Plastics Engineers, Inc., announces the organization of the Rocky Mountain Section of SPE on April 18, 1947, in Denver, Colorado and the organization of the Mid-continent Section of SPE on April 22, 1947, at Kansas City, Missouri. Officers of the Mid-continent Section are:

President—Ernest Bernard, Lami-Cast Plastics, Kansas City, Mo.

Vice-pres.—Barton L. Batty, 4424 Mill Creek Pkwy, Kansas City, Mo.

Sec-treas.—James G. Harper, Holiday Plastics, Inc., Kansas City, Mo.

Directors of the New Section, in addition to the above officers, are:

W. C. Schlager, Regal Plastics Co., Kansas City, Mo.; Brook Beatty, Beatty Plastics Co., Kansas City, Mo.; James D. Tribble, Howard Plastics Inc., Kansas City, Mo.; D. M. Kitterman, National Products Co., Kansas City, Mo.; N. L. Spelman, The Spelman Company, Kansas City, Mo.; Thomas J. Loberg, Wayne Porter & Staff, Wichita, Kansas.

Officers of the Rocky Mountain Section are:

G. F. Ingwersen, President; R. P. McClung, Vice-president; H. J. Crim, Secretary; W. L. Freeman, Treasurer.

Directors:

O. B. Yorker, J. W. Hendry, V. F. Rogers, J. G. Seder, Egon Wieselman .

A meeting of the Rocky Mountain Section was held April 30, 1947, at Denver, Colorado

CLEVELAND SECTION GETS NEW OFFICERS

The Cleveland section of the Society of Plastics Engineers has announced the appointment of two new officers as a result of the resignation of president Paul L. Reed, former editor of Industrial Plastics Magazine. Mr. Reed was forced to resign his office with the Cleveland section as he accepted a new position outside of Cleveland.

M. Scott Moulton, Technical Service Manager, B. F. Goodrich Chemical Company, former vice-president, has assumed the office of president, and Hugh Winn, instructor at Case Institute of Technology, has been named vice-president. Mr. Winn did not hold office prior to his appointment.

Notice

The national office of the SPE has been moved from Birmingham, Michigan to Cleveland, Ohio. All business and communications with the national SPE should be addressed to 8506 Lake Avenue, Cleveland 2, Ohio.

REPORT of the EDUCATION COMMITTEE

A National Committee Report **By LOUIS F. RAHM**

May 7, 1947

To the Council of the Society of Plastics Engineers
Gentlemen:

Your Educational Committee was appointed at the Chicago meeting of the Council January 27, 1947. Since then there has been delay in getting this committee into operation and consequently this report can at best cover no more than tentative plans for a functional program. Possibly this will be temporarily acceptable in lieu of a program report of active accomplishment.

"Considering first the general problems of an education committee for this professional society, the two outstanding aspects of the situation are the opportunities in this field and the difficulties arising from the breadth of interests involved.

"The opportunities, characteristic of any professional society, experiencing growing pains, are in this case greatly amplified by the unprecedented growth of the industry at a time when education was sacrificed in favor of emergency industrial performance on a national scale. With some backlog of professional personnel the earlier developed and integrated industries were in a more favorable position than plastics and this situation still maintains. As a consequence, the need of education in plastics is now recognized not only by the industry but by the educational institutions themselves. The problems of the latter are, chiefly: ways and means. Your Society can be most helpful in this field.

"The difficulties mentioned above are of course less pleasant to consider. The educational problem appears to be the training of highly specialized personnel in a field so broad as to leave the various specialists with little in the way of common interests or understanding. The difficulties are not insuperable as evidenced by the status of education in the analogous field of metals. Apparently what is needed is a common yardstick for general plastics education which will at the same time allow opportunity for specialization to suit the abilities of the individual. This is quite feasible but it is possible only through a carefully integrated educational effort. Your Society should be in position to offer constructive advice on this subject.

"The educational objectives of this Society, as stated in the By Laws, include, encouraging the establishment of courses in plastics through cooperation with educational institutions, and encouraging engineering research. Inasmuch as schools at all levels of education are presently interested in plastics education these institutions are in general receptive to suggestions regarding curricula. In several cases, schools have started courses of instruction of very limited or specialized scope and in many more cases similar institutions are quite willing to introduce plastics education but feel the lack of guidance in this new field.

"Thus the greatest immediate educational need which this Society may serve lies in an advisory service to such institutions. Since this presuppose plans which the Society may endorse it appears the first duty of this committee to formulate basic curricula suitable for adoption by schools variously at the graduate and undergraduate levels, leaving other fields of instruction and of research for later development as the need may arise. Where familiarity with an engineering curriculum in plastics at the University level may be helpful, the experience of Princeton will be freely available in the formulation of such plans.

"As to the organization of the Educational Committee, it appears desirable that this should equally represent the various interests of educational institutions and of industry. In this way, industry may make known its educational desires and confer with the teaching profession on ways and means of accomplishment. Further, it appears also desirable that representation on this committee should be on a basis of regional distribution where this may be observed.

"It is proposed that the teaching profession represent, so far as possible, chemical, mechanical and electrical engineering, chemistry, physics and technology. The complementary group may best represent the industrial interests in molding, laminates, adhesives and plywood, coatings, textiles and rubber. In the interest of continuity, it seems advisable to suggest three-year staggered appointments for members; thus requiring renewal of no more than one third of the committee each year.

"It is quite appropriate and desirable that the National Committee be composed of society members representing the local educational interests of the various sections of the society. In this formative period, this does not appear feasible and may well be deferred until the primary organization shall have obtained an actively functioning status.

"With no special consideration regarding present membership in the Society but with considerable thought as to professional qualification, twelve men have been tentatively selected to form the National Education Committee, representing institutions as follows:

Teachers	Industrialists
Columbia University	Boonton Molding Co.
Northwestern University	Synthane Corporation
Massachusetts Inst. Tech.	Resinous Products Co.
John Hopkins University	American Viscose Co.
Case School of Applied Science	General Electric Co.
Plast. Indus. Tech. Inst.	Stoner-Mudge Co.

"With assurance from the Council that the character of the Society will remain strictly professional and with Council approval for the general plan outlined above, the men selected will be invited to serve on this committee, with the hope that there may be more tangible progress to report at the September meeting.

(signed) Louis F. Rahm, Chairman.

Notes From The Minutes Of National Council Meeting

Mr. Richards was delegated to follow up the production of a standard badge for use nationally and in Sections on meetings. Also he was to contact Mr. Perce DeHan of the Toledo Section and follow through on the production of the new lapel button.

Mr. Dailey reported for the Meetings Committee stating that the next Annual Meeting would be held at the Rackham Memorial Building in Detroit, Michigan, from January 21 to 24, 1948, and that a limited exhibit would be held in the same building at the same time.

For the purpose of working out the details of the Technical Program and paper for this program, President Orr appointed a special committee of DuBois, Chollar, Dailey, Dr. Zottu, Reinecke and Delmonte.

Mr. Reinecke reported for the Speakers' Committee and the fine cooperation he was securing from the local sections. He urged sections to contact him on speakers, films and programs.

Mr. Richards reported for the Credentials Committee and urged new sections to contact his committee for advice.

Regarding the campaign for Sections, the Committee reports the formation of Section 17, Eastern New England at Boston, Section 18. Rocky Mountain Section at Denver, Section 19, Mid-Continent Section at Kansas City, Missouri and Section 20, Southern California Section at Los Angeles.

T. E. Orr, Chairman,
Membership Committee.

CENTRAL OHIO SEES H. P. M. Plant Number 2 Visited

By C. W. COOPER

The monthly meeting of the Central Ohio Section of the Society of Plastics Engineers was held on April 18, in the Globe Hotel at Mt. Gilead, O.

The Hydraulic Press Manufacturing Company acted as host at a dinner for 35 members and 47 guests, 18 of whom were members of the HPM staff.

Mr. R. W. Schreck of the H. P. M. sales group was ill and unable to deliver a talk on equipment made by his company and used in the plastics field, but Mr Fred Ziesenheim, Manager of Plastics and Die Casting Sales, organized a trip through H. P. M.'s plant No. 2. The group saw the machine shops at work on the various milling, planing, grinding, and boring operations necessary to produce small and up to the very large vertical and horizontal presses used in a number of industrial plastics and metal-forming applications.

H. P. M.'s new 4-ounce and 16-ounce injectjion molding machines and the compay's new 100-ton compression press were on display.

The May meeting will be held in Newark, Ohio at the Pharis Tire and Rubber Co., and will be under the guidance of Mr. Ralph Reel, vice-president in charge of Research and Development.

EASTERN NEW ENGLAND HOLDS FIRST MEETING

By GEORGE K. McLEAN

The first meeting of the Eastern New England Section was held at 7:30 p. m., April 23, 1947, at Hotel Puritan, Boston.

After a roast chicken dinner President Barnett called a short business meeting to order and broke the formality by having all present introduce themselves and their company affiliations. This was followed by the announcement of the appointment of Mr. Paul D. Zottu as the Sections Representative to the National Board of Directors.

Reports were given by the Secretary, Treasurer and Chairmen of Membership and Activities committees who in turn introduced the members of these various committees.

Mr. Barnett next introduced Mr. J. H. DuBois who gave an enlightening talk on "The Place of SPE in the Plastics Industry." Since Mr. DuBois was very explicit the discussion and questions which followed were few.

Mr. Barnett then introduced Dr. Dietz of M. I. T. who explained the object of the plastics research program which is being carried on at the latter institution in conjunction with PMMA.

After an interesting question period President Barnett adjourned the meeting at approximately 10:15 p. m.

JOINT S.P.E.-S.P.I. MEETING HEARS TALKS ON LAMINATES AND SYNTHETIC SAPPHIRES

The Philadelphia Section S. P. E. met with the local S. P. I. chapter at the Franklin Institute, April 21, in the last of a series of joint meetings the two groups have held this season.

Robert Metzler, of Hercules Powder Company, discussed developments and applications of thermoplastic laminates, specifically those involving cellulose acetate as the bonding resin. He described a machine designed to apply the resin to cloth as a hot melt and the building up of attractive assemblies from various decorative laminae.

Mr. Metzler pointed out that the advantages of laminates over those bonded with thermosetting resins lie in the speed with which they can be formed, depth of draws and shapes possible and the greater color range available because of the clarity of the base resin.

A film showing the cutting and finishing of synthetic sapphires supplemented a talk on the subject by John F. Ireland of the Elgin National Watch Company. The properties of these hard, wear-resistant stones were also described and some of the industrial uses illustrated by samples.

At the next meeting, to be held May 19 at the Franklin Institute, Gerould Allyn, of Resinous Products and Chemical Company, will discuss applications of synthetic resins in the coating field. Instead of a formal June meeting, members will hold their annual golf and swimming outing at the Melrose Coutry Club, June 24.

HYATT AWARD GOES TO DR. GREBE FOR STYRENE DEVELOPMENT WORK

The John Wesley Hyatt award, consisting of a gold medal and one thousand dollars, which is presented annually by the John Wesley Hyatt Award Committee for outstanding achievement in the plastics industry in the preceding calendar year, is awarded for 1946 to Dr. John J. Grebe, director of the Physical Research Laboratory, the Dow Chemical Company, Midland, Michigan.

Dr. John J. Grebe (third from left), winner of the John Wesley Hyatt Award for 1946, *chats with Walter Dorwin Teague, Dr. Charles F. Kettering, and Dean Richard F. Bach (in order, left to right). The annual award for outstanding achievement in the plastics industry was presented at ceremonies in Detroit, Mich. Dr. Kettering and Dean Bach, of New York's Metropolitan Museum or Art, are both members of the award committee.*

Dr. Grebe received the award—a gold medal and one thousand dollars—for his work in the development of pure styrene and of polymerized styrene. Robert F. Dreisbach, who worked with Dr. Grebe, was awarded a silver medal at the meeting

This award goes to Dr. Grebe for his work in the production of pure styrene and its polymerization. For some years before the war, Dr Grebe had been seeking an improved electrical insulating material. As pure polymerized hydrocarbons are well adapted to this use, his work led him to styrene. In this search for better plastic materials which could be used for electrical insulation, Dr. Grebe and the men associated with him in the laboratory did much of the major research work in this country on the production and polymerization of styrene. The great effort which his laboratory devoted to the styrene monomer made possible to a large extent the wartime production of styrene for the synthetic, or GRS, rubber needed in the war, and in plastics.

Dr. Grebe was born in the German Rhineland on February 1, 1900. He came to this country when a boy and was educated here. He received his Bachelor's degree in Physics from Case School of Applied Science (now Case Institute of Technology) He received his Master's degree from the same school in 1927. In 1935, Case awarded him its honorary Sc. D. degree. He was the youngest man ever to be so honored by that school.

Dr. Grebe was awarded the Chemical Industry Medal for 1943 for his contributions to the solution of some of the problems connected with the automatic control of chemical reactions.

Following his graduation from Case in 1924, Dr. Grebe became associated with the Dow Chemical Company on July 1 of that year.

Dr Grebe is the sixth recipent of the Hyatt award, which is sponsored by Hercules Powder Company to honor Hyatt, the father of the plastics industry. It was Hyatt's work with cellulose nitrate and camphor, in 1867, which resulted in the making of the first thermoplastic, celluloid.

The award was made at the Hotel Statler in Detroit Michigan April 23rd, before a distinguished gathering of seventy leaders in the plastics and automotive industries. The speech of presentation was made by Dr. Kettering, Vice-president of the General Motors Corporation in charge of research. Dr. Grebe in accepting modestly pointed out the fact that research work today is on an organization basis. Mr. Walter Teague, designer of New York City, was speaker of the evening. He spoke on designs for the future to maintain and improve civilization.

Thomas E. Orr, President of SPE and T. Walter Noble, President of the Detroit Section of SPE, were guests.

PRIZE PAPER CONTEST TO GIVE RECOGNITION TO YOUNG SPE ENGINEERS

A prize Paper contest which will give young engineers a chance to demonstrate their abilities and engineering potentials will be formally announced in the June issue of the SPE News. Papers submitted must be original, and deal with some phase of plastics (production, molding, enginering, etc.). The contest is open to members of the SPE who are not over thirty years of age. In general, the papers submitted should be approximately 2,500-3,500 words in length.

The papers will be judged by a committee of SPE members who are authorities in their fields; and the prizes offered will be well worth while.

Most important of all, however, will be the recognition that will come to the winner, as a man of outstanding ability and a potential leader in the plastics industry.

Watch for the formal announcement of this contest in the next issue of the SPE News which will give a list of the rules and tell about the prizes.

VENANGO PLASTICS OPENS

Venango Plastics Inc., at Franklin, Pennsylvania, announce the opening of their new Custom Injection Molding plant. Fred J. Kraft, president, has been connected with the Erie Resistor Corp.; the National Organ Supply Co.; and the Frank-In Plastics Division of the Robinson Industries as chief engineer. Robert J. Miller, owner of the Miller Equipment Co. of Franklin, Pennsylvania is Vice-president of the new company.

R. I. and S. E. MASS. HEARS R. L. FOOTE ON LAMINATES

By FREDERICK P. STEARNS

A most interesting and informative meeting of the Southeastern Mass. and Rhode Island Section of S. P. E. was heid on April 8 at the Hotel Biltmore in Providence. Members and guests met at the Town Room for dinner, adjourning to the Castle Room where over forty appreciative participants saw and heard about the latest developments in the laminated plastics field

The film "The Formica Story," courtesy of Formica Insulation Company, Cincinnati, Ohio, served as an excellent introduction to the characteristics of the plastics developments discussed during the evening This film should be a "must" on any plastic-minded individual's list. It portrays, as only a technicolor sound film can, the physical properties, comparative and actual, uses and recent applications, as well as the processing and skilled engineering and workmanship which goes into every development. The film not only tells the Formica story in layman's terms but to the sales and advertising-minded members, it illustrates what can be done through this medium in promotional and sales work.

Following the showing of the film, Mr. R. L. Foote of the Synthane Corporation was introduced. His interesting and informative talk on "Laminated Products—Their Manufacture and Application," supplemented by the film, made it a most worth while evening. The speaker built his story around a display of products, completed and in process, as well as some new developments made by the Synthane Corporation, during and after the war. Included were displays of base materials, partially treated with resins to form finished materials. Hundreds of different grades of materials and resins are available to be made into the appropriate combinations depending upon costs, properties and intelligent engineering selection. Punched and fabricated parts were shown, and the versatility of machinability on various end products as well as basic shapes, and tricks the consumer can do with them, were illustrated showing the tremendous potentialities of the laminated plastics in industrial applications, building materials, decorative materials, and end products for bettering our standards of living. During his talk Mr. Foote emphasized an important merchandising principle which should be constantly in the minds of individuals engaged in the manufacture or fabrication of plastic products. Your products should be developed and manufactured and presented for sale from the standpoint of a man with a need. This means the right product for the right job. Responsibilities from the engineering standpoint call for precision engineering in plastics, which is entirely possible if the producer builds for his customer, necessitating a complete working knowledge of his customer's needs. When considering policies of product development, it is well to bear in mind theoretical analyses of present products versus new product problems however, proper engineering of the established products you are trying to sell will make new product development much less hazardous and more inviting to the small scale manufacturer who hasn't capital to risk.

Plans are being discussed and formulated by the Southeastern Massachusetts and Rhode Island Section of S. P. E. for several programs to enhance the organization's ability to serve this locality in bettering plastics engineering policies and techniques, and to familiarize the general public with the work of the Section. Co-operation with local newspapers is being obtained by the Publicity Committee in regard to the publishing of articles concerning speakers, progress of the meetings, reports on new developments and materials as revealed by the speakers, and special articles written by men engaged in plastics manufacture and related industries in this locality. We also wish to encourage educational organization participation in the Society by arranging plant visits and demonstrations. Included will be arrangements for talks by educators as well as practical men in the field. It is the aim of the Section to establish a liaison between the theoretical and the practical as well as a general appreciation of the public for good plastics engineering with the Society as the binding mechanism, thus building and establishing it as an active and responsible organization.

Participation in such a program in the form of suggestions, material for publication, or news of general interest concerning personalities or developments in the industry is urged by the committee, specifically by getting in touch with Frederick P. Stearns, Engineering Department, Spencer Thermostat Company, Attleboro, Massachusetts.

CHOLLAR COMPARES METALS AND PLASTICS AT MIAMI

By JOHN L. RUSSELL

Speaking before the Dayton and Cincinnati members of Miami Valley Section of SPE on May 1, Mr. R. G. Chollar, Director of Research at National Cash Register Company and National Director of SPE, delivered a very interesting paper based on a fundamental comparison of plastics and metals as used in Engineering applications.

The talk was given in the auditorium of the Cincinnati Milling and Grinding Machines, Inc., Cincinnati, Ohio, and was preceded by dinner in the company cafeteria and a trip through the plant to view operations in the manufacture of precision milling, grinding, broaching machines, etc., as well as those adapted particularly to plastics processes. The large turnout of members and guests was given a hearty welcome by Mr. C. Robie, Vice President, at the conclusion of the dinner, and very efficient and courteous guides were provided for the factory tour. Following Mr. Chollar's talk, a sound picture entitled "The Age of Precision" was shown.

Program chairman for this highly successful

(Continued on Page 11)

NEW YORK HEARS LAWSON ON MOLDS; PLUME ON PLEXENE

By WILLIAM SCHACK

Stainless steel cavities were discussed at a joint dinner-meeting of the New York and Newark chapters held at the Hotel Sheraton, New York, on April 15. The speaker was Charles E. Lawson, Stainless Cavity Corp., Leominister, Mass., who described how they are made from master patterns of cast stone. Containing 13% chromium (and 1.5% carbon), the cavities have a surface like chrome plate. Mr. Dawson claimed they readily stand up under 100,000 psi and that they cost about one-third less than machined cavities and about the same as hobbed cavities, which he granted were preferable in certain cases. Some 80 to 100 molds produced by his company are in use for cold molding and injection molding, and cavities for compression molding are about to be put into production.

The same evening Dave Plume, of Rohm & Haas Company, gave a talk on Plexene, the newly developed modified styrene co-polymer, showing pen and pencil barrels, reflectors, safety goggles, frames and other molded and extruded products which embodied its special properties. He emphasized its good flow qualities in combination with heat resistance and strength, as well as its solvent resistance and diminsional stability. Molding temperature was given as 450-500° F, and the importance of heat on the die itself was stressed. The natural color of Plexene being light straw, a major problem has been to develop good clear light colors; but Mr. Plume said that steady improvement has been made in this respect .

CLEVELAND SEES ATOM TESTS

By GEORGE B. KOCH

The Cleveland section of the Society of Plastics Engineers heard B. F. Huntz, chief engineer of American Insulator Company, New Freedom, Pennsylvania, speak on the subject "Cold Molding" at the April 25th meeting. Mr. Huntz had his talk supplemented with some very interesting slides.

A change in plans for the March meeting brought Harry N. Stevens, research chemist, B. F. Goodrich Company, as guest speaker. Mr. Stevens spoke on the Bikini atom tests, which he attended as an industrial observer for his company. His talk was augmented by colored movies of the tests.

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SPI - SPE *(Con't from Page 2)*

given freely on a number of important matters of principle.

"It is further to be understood that the elegibility standards for individuals in the new organization are of vital importance. This applies to their standing as engineers and technicians. Both present members of SPE and SPI must meet these personal eligibility standards as they are drawn up by a joint committee of the two societies. Since this clause was contained in the previous proposal and met with no objection, we assume it continues to be satisfactory.

"Therefore, if the SPE council gives a favorable reception to this amended proposal, we recommend the following actions to be taken in the order listed as soon as possible:

"1. A committe composed equally of recognized engineers and technicians from the engineering division of SPI and from SPE shall meet to draw up eligibility standards for individuals. We suggest the committee consist of three or four men from each society.

"2. As soon as the standards for individuals are established, the same Committee should proceed to draft the physical form of the new organization. The agenda of this Committee should include: the name of the organization, number and type of officers, nature of chapter organizations, dues rate, etc.

"3. That one (1) and two (2) above be submitted along with a complete text of the amended SPI proposal and an identical letter of transmittal to the full voting memberships of both SPI and SPE for formal ratification and approval. To make this possible, the by-laws of SPI will be amended at the annual May meeting to provide for balloting by mail.

"4. That the voting by the two societies take place as nearly simultaneously as possible.

"We place at the disposal of the joint committee the full facilities of our staff organization to accomplish any of the above work.

"Very truly yours,
SOCIETY OF THE PLASTICS INDUSTRY
Neil O. Broderson, President."

After a full discussion of this letter, the Council unanimously approved the sense of the following letter to SPI:

May 7, 1947
Chicago, Illinois

"Mr. Neil O. Broderson, President,
The Society of the Plastics Industry, Inc.
Stevens Hotel
Chicago, Illinois
"Dear Mr. Broderson:

"The National Council of SPE has today considered the elements of your proposal for the coordination of the engineering activities in the plastics industry as outlined in your letter of April 22, 1947, to Mr. J. R. Hoover, President, The Plastic Materials Manufacturers Association.

"In its deliberations, the National Council of SPE is guided solely by what it considers the best interests of the entire plastics industry over a long period of years.

"From this viewpoint, your proposal is acceptable with the exception of the limitation placed on *future membership* in SPE by the fourth paragraph of your letter. This limitation of membership to those engineers whose companies are qualified members of SPI will do harm to the industry generally. The plastics engineers of the future are entitled to the benefits of an engineering organization without regard to their affiliation.

"However, it is our belief that the Joint Committee mentioned in your seventh paragraph can resolve this problem in its own way and make suitable recommendations to meet this problem of your Board.

"Therefore, we concur with your recommendations in your seventh paragraph for an early meeting of a Joint Committee. Immediately on receipt of advice from you we will appoint a Committee of four (4) members to meet with your group.

"The Directors of SPE appreciate your sincere efforts in these difficult negotiations and with assurances of our desires to cooperate in every particular, I remain,

"Yours very truly,
Thomas E. Orr, National President"

SEGNER REVIEWS GEON PROPERTIES AT ST. LOUIS

By J. MAVER FEEHAN

"The speaker at the April meeting of the St. Louis section was Mr. Clyde D. Segner of B. F. Goodrich Chemical Co. He covered the field of Geon resins quite well and had numerous samples of completed products to demonstrate such items as raincoats, shower curtains, etc. In the field of coatings and films his demonstration included everything from rigid types to highly plasticized varieties.

President Todd Clark has recently begun a membership drive in the St. Louis Section, this being in accordance with the request of the National President. It is hoped to increase the member ship considerably.

For the May meeting of the Section, Program Chairman Ray Lange announces that we will see two movies. The first is a sound film, in color, entitled "An Exact Duplicate" and is produced by Geo. Gorton Machine Co. and will deal with the various types of duplicating machines manufactured by them. The second film is to be a surprise, but will be timely and in a somewhat lighter vein. This May meeting will be on May 28th at a time and place to be announced later."

SPE-SPONSORED PLASTICS CLASSES END SUCCESSFUL YEAR

The SPE sponsored plastics courses given at John Huntington Polytechnic Institute of Cleveland, have just ended a successful year, with interest among the students running high about the possibility of an advanced course next year. The courses, which were well attended, were planned by W. R. Rupprecht as continuity instructor, and the lectures were given by Cleveland SPE members. W. P. Rupprecht, who left shortly before the end of the semester to direct the Kansas City School of Plastics for Warren Prince, also a former Cleveland member, was replaced by Jesse H. Day, Cleveland SPE member and editor of the SPE News.

CHICAGO HEARS GOLDSTON ON DOW-THERM; SEES MOVIE

By VAL WRIGHT

The April meeting of the SPE Chicago section, held at the Merchants and Manufacturers Club on April 10, was a double feature affair, with Joseph E. Goldston, director of the plastics division of Castaloy Corporation, Detroit, speaking on "A New Heating Medium For The Plastic Industry." Mr. Goldston's talk dealt with the use of Dow Therm E as a heat tranfer medium in 16,, 22 and 33-kw. capacity.

A sound film, "Basic Hydraulics," by the Adel Precision Products Co., Burbank, Calif., was also shown.

No regular meeting was scheduled for May, because of the numerous activities of industry members in connection with the 1947 annual SPI conference in Chicago. In place of the regular meeting, a cocktail party was held at the Stevens Hotel in connection with the SPI meeting.

Jean Reinecke, former president of the Chicago chapter, spoke on "Plastics and Light Metals" at the Museum of Science and Industry, Chicago, on April 13. Mr. Reinecke's talk was made as one of the Museum's spring lecture series, sponsored by the Chicago Technical Societies Council. He traced progress in the use of different materials, pointing out that until the last century, man had merey improved his methods of treating natural materials, whereas "today we have the synthetic age in which entirely new materials, never compounded in nature, are used."

During the course of his illustrated talk, Mr. Reinecke explained the difference between the thermosetting and thermoplastic types of plastics and gave typical examples of applications for plastics in fire covering, utensil handles, safety-glass inter-layer, fabrics, and other familiar roducts.

NEWARK FEATURES TALKS ON DIE - HOBBING; CELLULOSE

By EDWARD G. ACKERMAN

W. O. Bracken, Edmund W. Spitzig and Islyn Thomas were the gentlemen responsible for the highly successful May 14th meeting at the Newark Athletic Club. Mr. Bracken of the Hercules Powder Company spoke on the "Dimensional Stability of Cellulose Derivatives and Synthetic Resins at High Temperatures" and illustrated his talk with slides and samples. The second half of the program had Mr. Spitzig of the Newark Die Company and Mr. Thomas of Thomas Manufacturing Corp. in a general discussion on the "Advantages and Limitations of Die Hobbing" also illustrated with slides.

Everyone will agree who attended the second annual dinner-dance of the Newark Section on May 16th that the affair was a huge success. The committee worked hard and did a fine job of making the dinner-dance an even greater success than last year.

The June 11th meeting will be the last until the fall of the year. Speaking at this meeting will be Mr. R. E. Dodd of Durez Plastics & Chemicals, Inc. and Mr. T. C. Delaval-Crow of the New Departure Division, General Motors. "Diversified Uses of Phenolic Resins" will be the subject of Mr. Dodd's talk. Mr. Delaval-Crow will speak on "Ball Bearings and their Plastic Construction." Door prizes and dinner favors will be part of the evening's program.

Inasmuch as this June meeting will be the last until September it is urged everyone make an effort to attend and make this meeting one that will be hard to beat in regards to attendance.

N. W. PENN NEWS

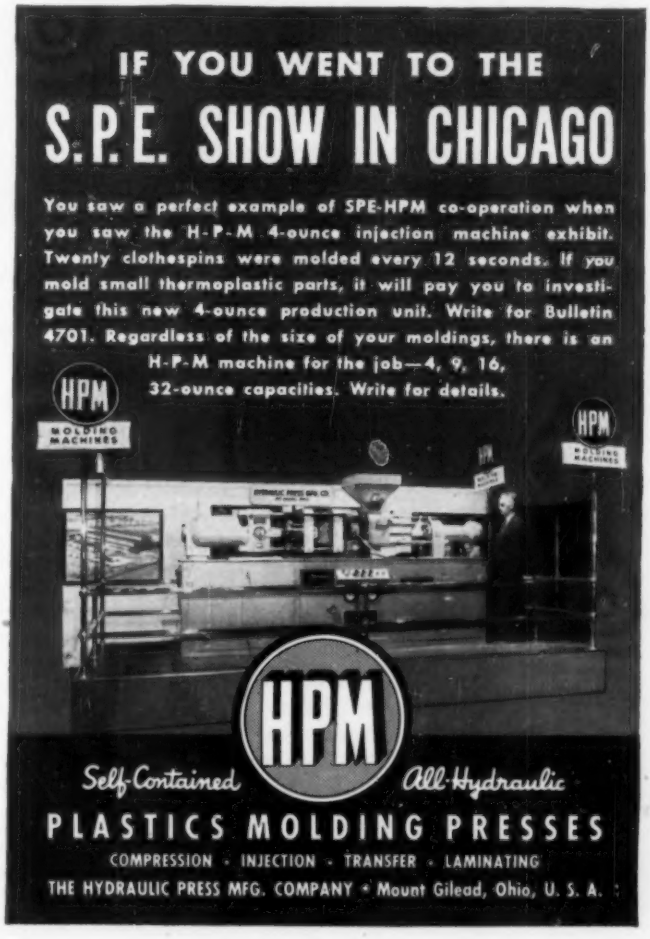
By N. R. REYBURN

On April 9 the section held its monthly dinner meeting at the Hotel Kenyon, Erie. A fine dinner was preceded by a social period. Twenty-eight persons attended all functions.

The business end of the meeting was opened by President Paul Roche, who announced receiving membership applications from Henry Callahan of Presque Isle Plastics, James Quinn of Quinn Berry Plastics, and Robert Ely, Carl Eckberg, Anthony Simons, Harold Seigle, all of Acorn Plastics. Bob Kling was announced as Chairman of the Professional Activities Committee.

Our speaker, Mr. G. S. Oblinger was introduced by Mr. Ed Roberts. Mr. Oblinger came up from Rohm and Haas to discuss acrylic molding material. His talk covered the development of acrylic

(Continued on Page 12)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S.P.E. SHOW IN CHICAGO
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Injection Molding (Con't from Page 1)

neer as he proceeds with the planning. Such a methodical approach demands a great deal of hard work, which probably is in addition to the work of making the jobs run after they start. But it is worth while to try to avoid troubles before they start, on the chance that once in awhile a job might run smoothly. It seems appropriate that plastics engineers who are involved directly in plant operations give their attention primarily to improving and smoothing these operations.

A list of eleven frequently encountered factors is offered as an example of a suggested check list. This isn't all there are, by any means, but the list will serve to provide a beginning.

The eleven factors are as follows:

1. A molding material with which the molder is not familiar.
2. A mold material which is untried.
3. A complex mold design which may turn out to be difficult to keep in operation, or for which it may be difficult to estimate production and maintenance costs.
4. An extremely low selling price requirement for the molded part in question.
5. Unnoticed dimensional tolerances.
6. A finishing problem. Unexpected mold flash. High luster requirements. Precision gate trimming.
7. A heavy section which may show "sinks." A thin section difficult to fill.
8. Inability to alter the plastics part design because other parts of an assembly are already prepared.
9. Quantity requirements not understood by all parties concerned.
10. Too close delivery date promise.
11. Uncertain source of supply for metal inserts, packaging materials and other auxiliary supplies.

If the injection molded parts in question are to be made of a material which is different in any way from materials which have been molded successfully in the plant before, there is excellent opportunity to encounter difficulty number one. Not all injection materials have the same molding characteristics. Some of them can stand more heat than others, and higher temperatures will make them flow better. Other materials must be given more time to heat at a low temperature. Still others may become stiffer instead of easier flowing if temperature or time are increased too much. Physical properties may be impaired by temperatures too high or too low. Nozzle heaters are good for sharp melting, narrow flow temperature range materials, and sometimes are not very useful for materials with wide flow temperature ranges, or with volatile plasticizers. Some materials show better mold release when the moldings are removed warm, and some are the opposite. Warping may be a problem if the pieces are removed too warm or too cool. Any of these factors, when encountered for the first time, may cause exasperating and expensive delays in beginning production.

Sometimes the plastics material may be incorrectly specified because of human inability to think of everything, or perhaps because of the customer's lack of a thorough knowledge of the plastics materials. The physical properties of the thermoplastics are largely interdependent. A good low temperature impact strength may be joined, through the plasticizer, to low rigidity at room temperature, softness, excessive cold flow, and lowered tensile strength. Persons not experienced in selecting plastics materials may easily select a material for one property, such as low temperature impact strength, for example, and find it too soft after the moldings are delivered. A purchaser may ask only for a hard material for an application which requires the best in electrical properties, and find out when he tests his moldings that the electrical properties are not what he requires. There are many more examples like these. They are not entertaining when they are your own, and you are in the middle of them. The man who is deciding how to do the molding, and how much the moldings are going to cost has the last chance to check the suitability of the molding material before the tooling commitments are made. The more he knows and remembers about plastics materials, the easier it is to turn out a smooth running production, right from the start.

Almost every new molding application involves some sort of pioneering in the matter of mold materials. Perhaps it is necessary to use a steel which is unfamiliar to the molding plant personnel, or perhaps the mold has to be obtained from a new outside source. If these two, more radical, conditions are not imposed, then something different in the way of machining, hobbing, heat treating, assembling, or plating the mold parts may be reqired—something beyond the experience of the molding plant staff. The possibility of having to make some parts more than once is good. It is necessary to think more than once about the details of obtaining a mold under these conditions, and all of the people responsible for building the mold should have a share in working out the problem as far as possible before the metal cutting starts.

Usually there must be a considerable amount of try out time for a new mold before satisfactory production can be obtained. The greater the number of mold parts, or the more complex the mold is, the greater will be the amount of time required to put every cavity, corepin, and ejector pin in proper operating condition. Automatic molds which have cam actions, gears, motors, or pneumatically operated parts often are found to require major changes in design because of unforeseen factors.

It isn't always lack of thoroughness in designing and building a mold which makes these major alterations necessary. No amount of reasoning and figuring is sufficient, in many instances, to determine how the plastics materials will flow into a mold cavity. The mold designer is often prevented from gating a part where he knows the

(Continued on Page 11)

WESTERN NEW ENGLAND HEARS DAWSON ON MOLDS

By GEORGE W. MARTIN

The April meeting of the Western New England Section was held at the Hotel Sheraton, Springfield, Mass. on the 2nd.

The very excellent speakers' program was shared by C. E. Dawson Pres., Dawson Associates, Leominster, Mass., whose subject was "Precision Casting of Stainless Steels for Plastic Molds," and W. R. Estabrook, Engineer Mold Cavity division, Merriman Bros., Boston, Mass., whose subject was "Powdered Metal Cavities in Plastic Molds."

As the subjects of the speakers were relative to partially competitive methods of mold cavity manufacture, a very spirited discussion was aroused and constructively enjoyed, to round out an excellent meeting.

Considerable interest was incited by the drawing for door prizes which were presented by Rogers Plastics Corp. and Noma Electric Corp. Rogers Plastics also distributed boxes of one dozen colorful plastic clothespins, to each person present.

The meeting was presided over by M. J. Petretti, Section Pres., and the speakers were introduced by F. J. Donohue, Section Vice Pres. Fifty persons were in attendance.

Miami Valley *(Con't from Page 6)*

meeting was Mr. G. J. Wilson, Vice President of Miami Valley Section. Mr. A. G. Plimmer of the Engineering Service Department, Cincinnati Milling and Grinding Machines, Inc., handled all arrangements for the visit in a very efficient manner. Both are to be congratulated, and we hope that there will be more meetings of this kind in the future.

The previous monthly meeting on Thursday, April 3, was also the occasion of a plant visit—this time to the Columbia Recording Corporation, Kings Mills, Ohio, where the manufacturing of plastic records was explained and operations viewed on a factory tour. A previously planned dinner and the tour were arranged by Mr. Andrew A. Wooley, General Manager, and supervised by Mr. J. A. Mitchell, Chief Engineer.

Mr. J. E. Baxter of Cincinnati is Program Chairman for the next meeting scheduled for Thursday, June 15th. Plans are now being developed and while no definite commitments can be made at this time, consideration is being given to a possible joint meeting with the Central Ohio Section at Granville, O.

Injection Molding *(Con't from Page 10)*

mold will fill properly, and sometimes he is not allowed a proper positioning of the part in the mold so adequate venting may be provided. Other difficulties may be introduced against the better judgement of the mold designer, and he may be required to build a mold which he knows is not as good as it should be. All that can be done in these cases is to see that all of the details of the mold design are as well executed as possible, and then depend upon experimentation to obtain production. This should be brought to the attention of the purchaser of the molded parts before the delivery date is set, so he will not be surprised as well as disappointed to encounter delay.

When a projected molding job involves an extremely low selling price, much difficulty may also become involved, in spite of the molder's normal precautions. All the way through the molding plant, no one wants to have his chances to produce good quality work injured by cut corners, in tooling, or in previous operations which have been performed upon the molded part. Yet, operations have to be made faster than any known previously, quality must be kept above a minimum standard, and material costs must be shaved. Usually these jobs require a lot of experimental work, and changes after production has begun, to correct items which cannot be worked out on paper beforehand. Allowances must be made for this work, and the estimates must be reviewed and revised until every cost is figured as low as possible before embarking on the job, with the customer's full knowledge of what is involved.

It isn't usually very difficult to see what toler-

(Continued on Page 12)

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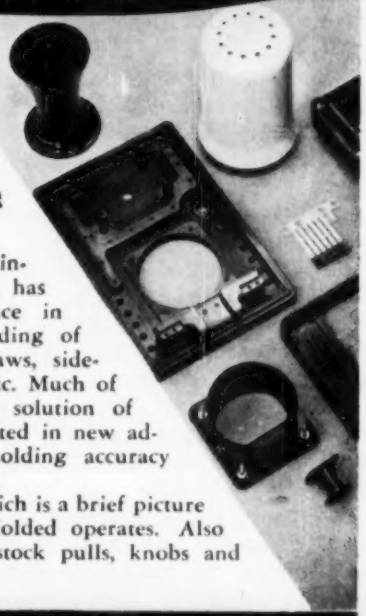

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Injection Molding

ances are involved in a plastics molding, once drawings and specifications are available. However, sometimes the meaning of a dimensional limit escapes realization. For example, a disc molding, of fairly large diameter appeared to be simple to mold and hold the outside diameter within .005" of its nominal dimension. But the molding material had a shrinkage variation of .001" per in. The outside diameter was 7½", and the variation in shrinkage due to cycling of the heaters, and unequal rates of cooling of the finished parts became .0075" or .0025" more than the allowable variation. This caused much delay in production because of the amount of work required in determining the molding conditions and a procedure for piling the finished pieces while they cooled. There isn't much chance to anticipate an occurrence like this, if no such thing is in one's previous experience.

It happens much too often in plastics molding that finishing the parts after they are molded doesn't receive adequate attention until the parts are piled up in the finishing department. Thermoplastic parts are often difficult to trim because of the rubbery flash. Buffing is another operation which usually requires more time than the hopeful estimator, and his customer, like to allow. Also, it isn't always possible to get by with merely tearing the molded part off at the gate. Sometimes a gate has to be enlarged so much to allow the mold to fill that it presents a trimming problem. It is a good idea to give some careful attention to possible finishing problems when figuring new work so as much difficulty as possible may be avoided.

It has been one of the most elementary rules of plastics molding that heavy sections and thin sections should not be joined to gether in a molding. This is still a good rule to follow, as far as it can be applied. However, progress in the demand for molded plastics has brought forward many applications in which this rule cannot be enforced. The progressive molder accepts such work as a part of his experimental business, and does the best he can. Molding cycles and temperatures of molds and materials are critical in operating to avoid "sinks" in heavy sections, or similar shrinkage marks at various places on the surface of the molding. It is likely to take a longer molding cycle for a heavy section, with most thermo-plastics. This fact should be considered in the estimate of the cost.

In reconversion times, the various branches of development are subject to getting out of step. One manufacturer of metal stampings may be able to complete several thousand component parts, while the supplier of the plastics moldings for the same assembly may fall behind because of delays, in tooling for example. Then when difficulties are encountered in molding, the amount of change in design is limited by the existence of the parts which the moldings must fit. Sometimes the metal parts can be reworked, but this is an extreme resort, and it is usually more difficult to put over than to work day and night to conjure a way to mold the plastics parts without changing their design. Usually, such items as this cannot be foreseen readily, and the effect is additional expense somewhere along the line, and it must b absorbed by the molder if he is unable to show due diligence.

It is well worth some extra time to check quantity requirements thoroughly. If the molding press time is fully scheduled for months ahead, there is little opportunity to add days to a production run in order to make parts for an increased order, or to make up time on work which was estimated at a higher rate than can be attained.

Modern production planning is based upon component parts being received on schedule. The metal working industry has had more years of experience than the plastics industry has, and more talent is usually available to overcome difficulties when they arise. Consequently, metal parts are more likely to be on schedule than are plastics and there is a certain amount of pride on the part of the molders as they try to be too optimistic in their delivery promises. Often, too, they haven't much choice except to accept a deadline which is too close. The only remedy in these cases is not to accept too many of them.

Arrangements should be made for sources of supply for metal inserts, packaging materials, and other auxiliary supplies, as well as for tools and molding materials a soon as possible after the order is placed for the moldings. Time is required to produce the outside supplies, just as it is required to engineer and build the mold and other required tools for the plastics. People have been known to spend too much time at the beginning of a job to design a mold, and thereby handicap the fellow who has to make the metal inserts.

The business of injection molding plastics materials is complex, and the responsibilities for successful operation rest on the shoulders of relatively few men by comparison with the amount of responsibility in some other lines of engineering. The amount of responsibility carried by plastics engineers seems to be increasing rather than decreasing, and it seems that a methodical outlining of the known facts should be helpful in providing opportunity to learn some new things without being always entangled in routine problems which might have been avoided by more careful preliminary work.

N. W. Pennsylvania (Con't from Page 9)

and problems of separating flow, heat resistence, and edge color characteristics. He announced a new development which showed considerable progress along toward the goal of high heat resistence (203° F.) combined with easy flow and water white edge color.

To clarify the acrylic versus polystyrene picture, Mr. Oblinger outlined the fields where acrylics are outstanding; namely, clarity in heavy sections, good weathering resistence, 203° F. heat resistence, and a superior resistence to crazing.

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